

**ABSTRACT**

A pumping apparatus (50) which isolates a sample (52) from a pump (72), thereby circumventing the so-called "memory effect" problem. The sample is pumped into an intermediary, or buffer region (64) using a first pump (54). The sample is displaced from this buffer region by pumping a second fluid (74) into the buffer region using a second pump (72). When the sample is displaced from the buffer region it proceeds to a mixer (78) where it can be diluted before analysis. The second pump is required to operate with a high degree of accuracy so that the sample is diluted by a consistent amount. Preferably, the second pump is a highly accurate piston pump.

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